

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

July 11, 2005

TO: Internal File

THRU: Karl R. Houskeeper, Environmental Scientist III, Team Lead

FROM: Wayne H. Western, Environmental Scientist III/Engineering

RE: Excess Spoil Disposal Area #2 Design Revision, Sunnyside Cogeneration Association, Sunnyside Refuse/Slurry, C/007/0035, Task ID #2223

SUMMARY:

Sunnyside Cogeneration Association submitted an amendment to modify the second excess spoil disposal area. The Division received the application on April 18, 2005.

This technical memo deals with engineering and bonding issues.

TECHNICAL ANALYSIS:

OPERATION PLAN

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Coal Mine Waste

The Permittee met the general requirements for coal mine waste handling. Those requirements are that each plan shall contain descriptions, including appropriate maps and cross-

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section drawings of the proposed disposal methods and sites for placing underground development waste and excess spoil generated at surface areas affected by surface operations and facilities. Each plan shall describe the geotechnical investigation, design, construction, operation, maintenance, and removal, if appropriate, of the structures. That information is in the Excess-Spoil Disposal Area #2 Design Appendix.

The Permittee met the requirement to have all coal mine waste placed in new or existing disposal areas within a permit area that are approved by the Division for this purpose. The plan for coal mine waste disposal is in the approved MRP.

Specific requirements for handling coal mine waste are to:

- *Minimize adverse effects of leachate and surface-water runoff on surface- and ground-water quality and quantity.* The Division considers that the Permittee met those requirements if all the hydrology requirements are met. In addition, in the Protection of Surface and Ground Water Section, the Permittee refers to the general site conditions for protection. The site does not have springs, natural or manmade watercourses, or wet weather seeps.
- *Ensure mass stability and prevent mass movement during and after construction.* The Permittee met those requirements by committing to construct proper foundations, place the material in two-foot lifts and have a 15-20% outslope.
- *Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use.* The Division considers that the Permittee meets those requirements if the revegetation and postmining land use requirements have been addressed.
- *Not create a public hazard.* The Division will conduct monthly inspections to insure that the site does not become a public hazard.
- *Prevent combustion.* The Permittee did not adequately address this section. In the Burning and Burned Waste Utilization Section, the Permittee states that all possible efforts will be made to reduce the potential for the occurrence of coal mine waste fires. The Division needs specific ways that will be used to prevent combustion.
- *Coal mine waste materials from activities located outside a permit area may be disposed of in the permit area only if approved by the Division. Approval shall be based upon a showing that such disposal will be in accordance with the standards of this section.* The Permittee met the requirements of this section. In the Introduction Section of the Appendix, the Permittee states that coal mine waste materials from

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activities located outside the SCA permit area may be disposed of in the permit area only if the proper characteristics to be consistent with the design stability of the fill as stated in this Appendix. The Division cannot accept general commitments, the Permittee must either state where the coal mine waste will come from or state that they do not plan to accept material from other locations at this time. In addition, the Permittee must also state specifically why the material would not cause a problem.

- *The disposal facility shall be designed using current, prudent engineering practices and shall meet any design criteria established by the Division. A qualified registered professional engineer, experienced in the design of similar earth and waste structures, shall certify the design of the disposal facility. The disposal facility shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments must be stable under all conditions of construction. Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of the foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the disposal facility.*

If any examination or inspection discloses that a potential hazard exists, the Division shall be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented the Division shall be notified immediately. The Division shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

The plans were developed by a professional registered engineer and are similar to the existing plans for the site. The refuse piles are similar to other structures for which slope stability analysis shows that slopes of 15-20% will be stable.

Refuse Piles

The general requirements for refuse piles are that they meet the requirements of coal mine waste, the additional requirements provided below and the requirements of 30 CFR Sections 77.214 and 77.215. The Division addressed the requirements for coal mine waste in other sections of the TA. The Division considers that the Permittee is in compliance with 30 CFR Sections 77.214 and 77.215 if MSHA grants approval.

The specific requirements for the refuse pile are:

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- *The design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the disposal facility, and ensure stability.* In subsections Protection of Surface and Ground Water, Hydrologic Flows and Erosion Control, the Permittee describes the diversions. The Permittee met the requirements of this section by stating that underdrains would not be used.
- *Uncontrolled surface drainage may not be diverted over the outslope of the refuse pile.* The Permittee met the requirements for the reclamation phase by • stating in the Erosion Control section that uncontrolled surface drainage will not be diverted over the out-slope and • committing to pock the final surface to minimize erosion.
- *Runoff from areas above the refuse pile and runoff from the surface of the refuse pile shall be diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff diverted from undisturbed areas need not be commingled with runoff from the surface of the refuse pile.* The Division considers that the designs are adequate if the Permittee meet all the hydrologic requirements. The diversion designs are in the Protection of Surface and Ground Water section.
- *Underdrains shall comply with the general requirements for the disposal of excess spoil.* The Permittee met those requirements by stating in the Protection of Surface and Ground Water section that underdrains will not be used.
- *Slope protection shall be provided to minimize surface erosion at the site. All disturbed areas, including diversion channels that are not riprapped or otherwise protected, shall be revegetated upon completion of construction.* The Permittee met those requirements by committing in the Erosion Control section to use vegetation to control erosion.
- *All vegetative and organic materials shall be removed from the disposal area prior to placement of coal mine waste. Topsoil shall be removed, segregated and stored or redistributed. If approved by the Division, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.* The Permittee met those requirements by stating in the Construction section that there is not topsoil and that vegetation is minimal.
- *The final configuration of the refuse pile shall be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the refuse pile if required for stability, control of erosion, conservation of soil moisture, or facilitation of the approved postmining land use. The grade of the outslope between terrace benches shall not be steeper than 2h:1v (50 percent).* The Division addresses the postmining land use requirements in other sections of the TA. The Permittee will not use terraces but rather

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will use extreme roughening techniques to control erosion. The outslopes will have a 15-20% grade.

- *No permanent impoundments shall be allowed on the completed refuse pile. Small depressions may be allowed by the Division if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation, and if they are not incompatible with the stability of the refuse pile. The Permittee met those requirements by stating in the Construction section that no permanent impoundments will be constructed. In addition, extreme roughening techniques will be used to control erosion.*
- *Following final grading of the refuse pile, the coal mine waste shall be covered with a minimum of 4 feet of the best available, nontoxic and noncombustible material, in a manner that does not impede drainage from the underdrains. The Division may allow less than 4 feet of cover material based on physical and chemical analyses which show that the revegetation requirements will be met. The Permittee did not meet the minimum requirements of this section of the R645 Rules. In the Erosion Control section, the Permittee states that they will use less than four feet of borrow material in an attempt to show that vegetation can be established. The Division requires that four feet of fill be used until the Permittee can show otherwise.*
- *A qualified registered professional engineer, or other qualified professional specialist under the direction of the professional engineer, shall inspect the refuse pile during construction. The professional engineer or specialist shall be experienced in the construction of similar earth and waste structures. Such inspection shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include, at a minimum: Foundation preparation including the removal of all organic material and topsoil; Placement of underdrains and protective filter systems; Installation of final surface drainage systems; and, The final graded and revegetated facility. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of coal mine waste materials. More frequent inspections shall be conducted if a danger of harm exists to the public health and safety or the environment. Inspections shall continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.*

The qualified registered professional engineer shall provide a certified report to the Division promptly after each inspection that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan and this Chapter. The report shall include appearances of instability, structural weakness, and other hazardous conditions. The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains

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are covered with coal mine waste. If the underdrain system is constructed in phases, each phase shall be certified separately. The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site. A copy of each inspection report shall be retained at or near the mine site. The Permittee met the requirements of this section by committing in the Inspection section to conduct all required inspections and maintaining proper records.

Excess Spoil:

The Permittee refers to the amendment as excess-spoil disposal area #2. The terms spoil and excess spoil do not apply to material proposed to be placed in and around Slurry Pond # 1, Slurry Pond #2 and the Clearwater pond.

In Section R645-301-200, the Division defines the following terms:

- "Spoil" means overburden that has been removed during coal mining and reclamation operations.
- "Overburden" means material of any nature, consolidated or unconsolidated, that overlies a coal deposit, excluding topsoil.
- "Excess Spoil" means spoil material disposed of in a location other than the mined-out area, provided that the spoil material used to achieve the approximate original contour or to blend the mined-out area with the surrounding terrain in accordance with R645-301-553.220 in nonsteep slope areas will not be considered excess spoil.
- "Coal Mine Waste" means coal processing waste and underground development waste.
- "Coal Processing Waste" means earth materials, which are separated from the product coal during cleaning, concentrating, or the processing or preparation of coal.
- "Refuse Pile," means a surface deposit of coal mine waste that does not impound water, slurry, or other liquid or semiliquid material.

Because the terms spoil and excess spoil have been used to describe the material within the Sunnyside Cogeneration Associates permit area the Division will allow the use of the terms spoil and excess spoil.

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Findings:

The information provided in the amendment is not considered adequate to meet the minimum requirements of the regulations. Before approval, the Permittee must provide the following in accordance with:

R645-301-553.252, The Permittee must commit to cover all coal mine waste with four feet of non-acid and non-toxic materials. The Division can reduce the amount of cover needed if the Permittee shows that less than four feet is needed.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Mining Facilities Maps

The Permittee met the requirements for supplying mine facilities maps. The requirements related to Excess-Spoil Disposal Area #2 are: • water diversions, each waste disposal facility relating to coal processing • plans and cross sections specified by the Division, of the anticipated surface configuration to be achieved for the affected areas during mining operations. Map 9-8A and Map 9-8D show the existing surface configuration. Map 9-8B, Map 9-8C, and Map 9-8D show the anticipated surface configuration when the facilities are fully developed. The maps show the location of ditches and the location of coal mine waste.

Certification Requirements

The Permittee met the requirements for this section. Those requirements are that cross sections, maps, and plans required to show the design, location, elevation of facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer to prepare and certify such cross sections, maps, and plans. The maps and cross sections in the Excess-Spoil Disposal Area #2 Design were certified.

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Findings:

The information provided in the amendment is considered adequate to meet the minimum requirements of the regulations.

RECLAMATION PLAN

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The definitions of Approximate Original Contour (AOC) are contained in the Surface Mining Control and Reclamation Act (SMCRA) and the Utah coal rules. The objectives of post-mining backfilling and grading is to return the site to a configuration resembling the topography of the land prior to mining, and to blend the site into the drainage pattern of the surrounding terrain. At the same time, the Permittee must meet reclamation performance standards including: controlling erosion; establishing mass stability; and establishing permanent, diverse, and effective vegetative cover.

The Division intended Technical Directive 002 to reconcile the specific performance standard requirements of the regulatory program with the general definitions of AOC in a way that accomplishes the objectives of SMCRA.

Final Surface Configuration

The Permittee met the requirements for establishing the final surface configuration. Those requirements are that the post-mining topography, excluding elevation, closely resembles its pre-mining configuration. The Division's findings were as follows:

- Mining prior to the enactment of SMCRA disturbed the existing surface. The Permittee does not have premining contours. Even if such maps existed the Division would not require the pre and postmining elevations to be similar. The site is used to burn coal mine waste to generate electricity. The waste product must be disposed of.

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- The final surface configuration will be stable, which will allow the Permittee to control erosion and establish vegetation.

All Highwalls to be eliminated

There are no highwalls at the site; therefore the Permittee met those requirements.

Hydrology

General concerns with hydrology are that the Permittee restore drainages, control sediment, and prevent hazardous and toxic discharges. The Division considers that the Permittee will meet those conditions when they meet the hydrologic reclamation requirements.

Findings:

The information provided in the amendment is considered adequate to meet the minimum requirements of the regulations.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

General

The Permittee met the general requirements for backfilling and grading. Those requirements are that the disturbed areas shall be backfilled and graded to: achieve the approximate original contour; eliminate all highwalls, spoil piles, and depressions; achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved postmining land use.

The Division discussed the requirements for achieving the approximate original contour in that section of the TA. There are no highwalls at the site. While the Permittee often refers to spoil in the MRP there is no true spoil on site. (Spoil is defined as overburden that has been

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removed during coal mining and reclamation operations.) The depression that exist in the area, Slurry Pond #1, Slurry Pond #2 and the Clearwater Pond will be filled in as part of the operational activities. The slopes have been designed to achieve a minimum static safety factor of 1.3 or greater and be stable.

The Division considers the design to minimize erosion and water pollution if the hydrology requirements have been addressed. The same is true of the postmining land use requirements.

Previously Mined Areas

The requirements for previously mined areas deal with highwalls. Since there are no highwalls on site those requirements do not apply.

Findings:

The information provided in the amendment is considered adequate to meet the minimum requirements of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Final Surface Configuration Maps

The Permittee must update all maps that show the final reclamation topographic maps. Those maps include but are not limited to Map 8-2, Permit Term Reclamation Map Rough Grading Plan and Map 10-5, Final Reclamation Drainage and Diversion Plan.

Certification Requirements.

All the appropriate maps that have been submitted were certified.

Findings:

The information provided in the amendment is not considered adequate to meet the minimum requirements of the regulations. Before approval, the Permittee must provide the following in accordance with:

R645-301-542.200, The Permittee must update all maps and cross sections that show the final surface configuration for all maps that show the excess-spoil disposal area #2. Such maps include but are not limited to Map 8-2, Permit Term Reclamation Map Rough Grading Plan and Map 10-5, Final Reclamation Drainage and Diversion Plan.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

Determination of Bond Amount

The Permittee must update the bond as follows:

- The Permittee must escalate the bond for 5 years. The current escalation amount is 4.44% per year. The escalation takes place at or near the midterm review and the midterm is scheduled for August 2005.
- The Permittee must update the unit cost to 2005 costs when possible.
- The Permittee must update the bond to take into account any changes to the reclamation plan.

The Division will assist the Permittee by providing updated unit costs. Once the bond has been determined then the Permittee must post additional bond if needed.

Findings:

The information provided in the amendment is not considered adequate to meet the minimum requirements of the regulations. Before approval, the Permittee must provide the following in accordance with:

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R645-301-830.130, The Permittee must update the reclamation cost estimate to take into account any changes that result from changes to the reclamation plan.

R645-301-830.140, The Permittee must update the unit cost to 2005 costs. The Division will assist the Permittee with unit cost information as needed.

R645-301-830.300, The Permittee must escalate the bond by 4.44% per year for 5 years.

R645-301-850, The Permittee must increase the bond as needed to insure that the Division can accomplish reclamation in the event of bond forfeiture. The amount will be determined after the Permittee supplies the Division with update reclamation cost estimates.

RECOMMENDATIONS:

The Division should deny the amendment until all of the above mentioned deficiencies have been addressed.